Section 3
Project Control

“If everything seems to be going well, you obviously don’t know what’s going on.” – Edward Murphy

Nếu mọi thứ dường như là đang suông sẽ hết, thì rõ ràng là bạn chẳng biết chuyện gì đang xãy ra.

Are we on schedule? YES

Do you think we will meet the objectives? YES

Are we meeting the customers' expectations? YES

– Project Sponsors

Project Sponsors

- Users
- Customers
- Business leads
- Executive Management
- Finance

Elements of Project Control

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Reports & Communications Management

Configuration & Requirements Management

Risk & Issue Management

Quality Management

Integration Management

Procurement Management

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Project Control

The tools and processes are applied to monitor and measure the progress of a project.

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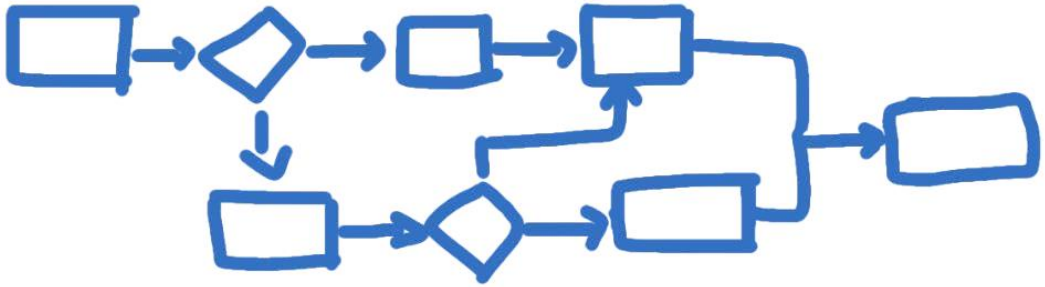

Monitoring and Measuring

- Monitoring the project variables
- Measuring the ongoing project activities
- Identifying corrective actions
- Managing change control

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Results of Good Project Controls

- Stay on schedule
- Provide consistent deliverables
- Meet quality expectations
- Meet performance expectations
- Articulate and remediate gaps or deviations
- Identify and correct issues/risks

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More Than Just Controls

- Leadership
- Communication
- People Skills
- Team management

Key Project Control Activities

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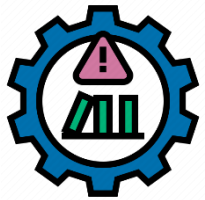
Communication and Reporting

Requirements Management

Quality Management

Change Control



Risk Management

Issue Management

Configuration Management

Procurement Management

Report & Communication Management

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What is Communication Management

Manage communicating project information and reports to your stakeholders, customers, users, and team members effectively in order to:

- Keeps the team and your stakeholders aligned on the project’s goals.
- Helps create transparency and get stakeholder buy-in.
- Builds better relationships with clients or outside agencies.

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Why Do Reporting

- Consistent and regular reporting will inform everyone on what's going on
- Shows that your team knows what they are doing: public relations
- Allows others to review progress and provide inputs
- Documents who is responsible and accountable for project tasks, issues and risks
- Helps manage everyone's expectations and answer these questions:
  - Are we on schedule?
  - Do you think we will meet the projects' objectives?
  - Are we meeting the customers' expectations?

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Communication Roadmap

- Determine what information you need to provide
- Determine the form and content of that information
- Determine the source of data for that information
- Determine how to monitor and measure that information
- Determine who you need to provide it to
- Determine how often you will provide it

⇨ Most of them have been setup in Communication & Reporting Plan

Example: Report & Communication Management

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NAME	TITLE	FREQUENCY	FORMAT & CHANNEL	NOTES
John Riley	CEO	Major milestones only	High-level time-line / budget / progress updates via email.	Prefers to see updates before they're finalized to offer any feedback

Report Type	Description	Communication Type
Weekly Status	This report is distributed weekly via email to the entire team, customers and stakeholders. It provides a high level description of the activities over the last week and the upcoming week. It also includes any critical issues.	Asynchronous
Stakeholder Review	The review may be held monthly and is targeted just to the stakeholder audience. It is usually in PowerPoint format, easy to read and understand and given as an in-person presentation.	Synchronous
Project WBS	This is a detailed project work breakdown structure showing tasks, actual hours, estimated hours, dates, milestones, etc. in an EXCEL format and is available on request.	Synchronous

Synchronous vs Asynchronous Communication

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Synchronous Communication

- Means that two or more people exchange information in real-time and expect real-time responses.
  - **In-depth interactions:** brings the opportunity for more in-depth interactions.
  - **Real-time resolutions:** enable to address different issues on the spot.
  - **Disrupts focus:** it can really disturb an individual's focus.
  - **Tough on time zones:** time zone differences profoundly impact the quality of synchronous communication. While a call's time may be optimum for some, for others it may be well into the night.

VS

Asynchronous Communication

- Makes it possible for people to respond and act on their own terms. It allows for everyone to be proactive instead of reactive.
  - **Enable flexibility**: less pressure to answer immediately, therefore people can focus on the quality of response and give the message in full attention and best suits.
  - **Time-zone friendly**
  - **Lacks sense of immediacy**: action can't be made immediately and require some time. This less immediate interaction can leave you hanging and uses your valuable time.
  - **Disconnect in communication**: cannot handle urgent situations. There are times when urgent or sensitive matters require synchronous communication, and it's important to be able to recognize and respond accordingly.

Tips of Communication Controls and Treatments

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- Identify the right purpose to choose a suitable communication type, synchronous or asynchronous:
  - Ask for instant feedback?
  - Need be a clear and detailed response?
  - Focus on a personal connection?
- Identify the right format of response based on communication style:
  - Analytical: Prefer hard facts and numbers.
  - Intuitive: Love broad overviews and seeing the big picture.
  - Functional: Most comfortable when diving into the details of functionality.
  - Personal: Focus on emotions and creations.
- Plan even when it’s impromptu, and adjust promptly.
- Use the right tools: chatting tools, tracking tools, Q&A list, DoD (Definition of Done), MOM (Minutes of Meeting), etc. …

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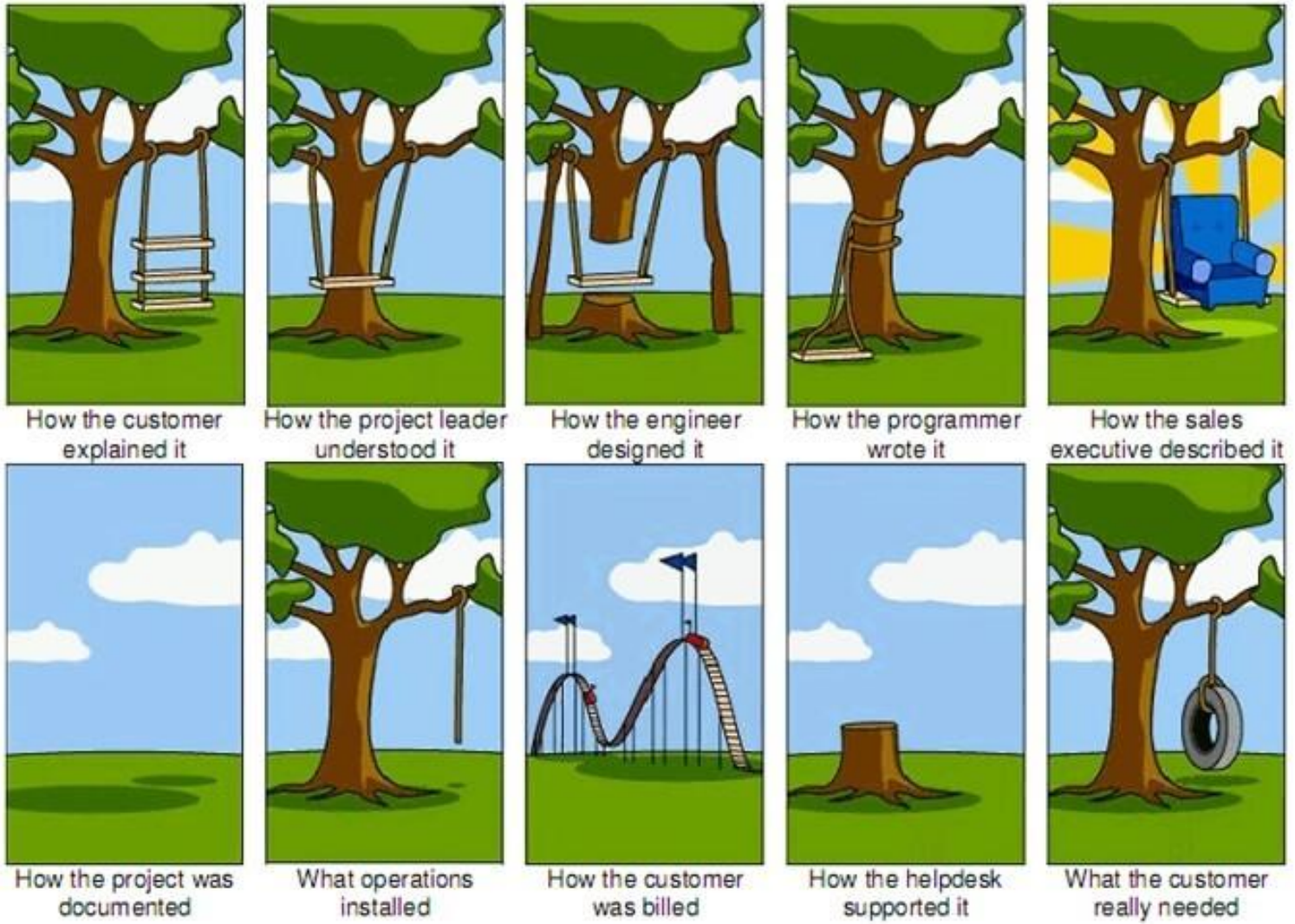
What is Requirement Management

Ensuring **all requirements** are identified, tracked, and managed.

Control Items: In short, all aforementioned **deliverables** in PDD. It should compose of verified items:

- Project scopes: user acceptance criterion, in/out scopes, assumptions, constraints …
- System features: functional, non-functional, system supplementary documents.
- System/project configurations: conditions deployment/testing environments, CSV, release package definitions, source code structures…
- Policies, Standards, , Trade & Copyright information …
- etc. …

Requirement Management Issues?



Why Do Requirements Management?

- Typically…
  - Requirements are documented in a variety of ways before the project begins and during the project running.
- What happens after the project begins?
  - Focus is on writing software and not on maintaining the requirements document
  - Scope-creep: when a project's requirements, goals, or vision changes beyond what was originally agreed upon.
- Issues that will arise:
  - Software engineers do not know what to do
  - Users expect something in the final system, but you didn't document it
  - If the requirements specification is used for testing, it will not match the system.

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Requirements Management Roadmap

- Requirements management is a sub-set of the change control process.
- Develop Requirement Management Process: Identify, track, document and manage all requirements throughout the project lifecycle.
- Deal with Scope Creep: How can you avoid it?
- END GAME: the requirements document will **exactly** match the system.

Requirement Management

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Develop Requirement Management Process

- Gathering Requirements
- Review, analyze, prioritize each requirement.
- Identify requirement status: Approved, On-hold or Reject
  - Approved, update specification & develop plan to support this requirement.
  - On hold, update specification & document why it is on hold or pending decision.
  - Not approved, update specification & document why it is rejected.

Example: Requirement Tracking List

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Item #	Work package	Status	Baselined Version	Sufficient Input?	Has detailed info?	Output satisfied?	Req. Score	Maturity Percentage	Maturity Rank
200.10	Develop the master page, CSS, bootstrap as a basic for dev	Approved	1.0.2	All confirmed	All confirmed	AC Confirmed	112	100.0%	1
200.20	Develop the navigation, header, footer, logo, etc	Approved	1.0.1	All confirmed	All confirmed	AC Confirmed	112	100.0%	1
200.30	Develop the error pages - Group ID missing and valid	Approved	0.9.2	70%	80%	AC Confirmed	84	75.0%	5
200.40	Private Label Usage and Support	On-hold	0.0.9	All confirmed	70%	Int.Output Confirmed	49	87.5%	6
200.50	Develop Registration landing page	Approved	0.9.5	90%	70%	AC Confirmed	98	87.5%	4
200.60	Develop enrollment confirmation email / template / email out	Approved	1.0.0	All confirmed	All confirmed	AC Confirmed	112	100.0%	1

- Deliverables: WBS – work packages, system documents, functional, non-functional features.
- Configuration items

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Quality Management is to

Ensure that the **project deliverables** meet quality expectations.

Ensure you deliver what the customer wants, when they want it, within **the project parameters**.

The best quality is planned for and not inspected afterward.

Control Areas:

- Communications and Reporting: Q&A number, response time, resolved number,
- Requirements: Q&A number, defect number, defect removal efficiency (DRE)
- Schedule: schedule deviation
- Procurement: all or sub-set of above items.

SDLC: Requirement, Design, Code, Test, Deploy

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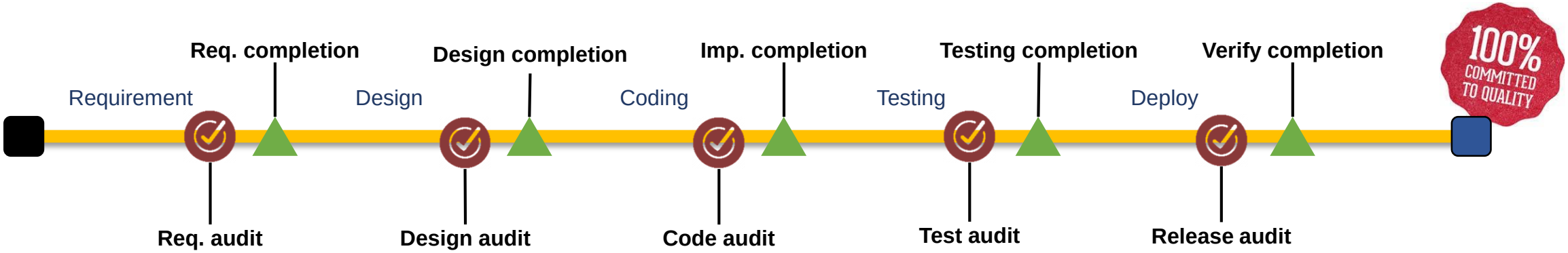
Quality Management Roadmap

- Determine deliverables, preliminary schedule (phases, release milestones), policies and standards, approved proposals/approaches …. which collected from PDD.
- Develop quality management process throughout the development lifecycle, methodologies:
  - Identify (entry acceptance criteria or) completion criteria.
  - Identify performance indexes (KPIs), taxonomy and control limits (UCL, Mean, LCL).
  - Identify review and inspection methods: static tools, peer review, inspection review
  - Identify other quality management techniques: checklists, conventions, guidelines, standards
  - Identify Audit milestones and reports: analyze on over control limits, taxonomy trends, and completion criteria, then give out corrective/preventive actions



Example: Define Completion Criteria from Requirements

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Quality Policies in Project Definition Document

8 プロジェクトマネジメント基本方針(7)–社外秘

内部設計完了	処理設計書、ER図、テスト計画書	山口 良太	山田 太郎様	優先度: 高の課題で未解決のものが0件
開発実施完了	サブシステム内結合テスト結果、結合テスト仕様書	山形 高志	山田 太郎様	優先度: 高の課題で未解決のものが0件
結合テスト完了	結合テスト結果、システムテスト計画	山口 良太	山田 太郎様	優先度: 低/中/高の課題で未解決のものが0件
システムテスト完了/仮稼働開始	システムテスト結果、テスト済みシステム	山口 良太	山田 太郎様	優先度: 低/中/高の課題で未解決のものが0件
本稼働開始		山口 良太	山田 太郎様	優先度: 低/中/高の課題で未解決のものが0件

テンプレート提供: PMI日本支部 23

Completion Criteria in Quality Management Plan

Detailed Design (DD) Phase: Completion Criteria

- **Review Defect:** All targets in Processing Design Document, ER Diagram, Testing Plan finished.
- **Evaluation:** Zero HIGH defects remained (opening).

Integration Test (IT) Phase: Completion Criteria

- **Review Defect:** All targets in IT Testing Report, System Testing Plan finished.
- **Evaluation:** Zero LOW/MED/HIGH defects remained (opening).

Example: Completion Criteria of Design Phases

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Item	Conditions for completion
Review defect	All actions suggested in the design document review have been taken, or there is little or no influence on subsequent phases.
Quantitative evaluation	Target quality values have been achieved, and it is concluded that quality is good. (Quality improvement actions have been taken when necessary.) If actual values are not within the allowable range, a validity evaluation has been conducted and necessary quality improvement actions have been taken.
Qualitative evaluation	A quality evaluation has been conducted by analyzing the review defects, and necessary quality improvement actions have been taken.
Report	The final quality evaluation report has been submitted, verified by a third party, and approved by the project manager in the quality meeting.

Quantitative evaluation for test-case distribution in Test Design

Test Case	Normal	Abnormal	Limit/Boundary	Interface
Test case ratio	Less than 60%	20% or more	15% or more	5% or more

Example: Completion Criteria of UT Phase

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Item	Conditions for completion
Test case	Target test case density values have been achieved.
	All test cases have been passed.
Coverage	C0,C1 is 100%
Detected defect	All actions for detected defects have been taken.
Quantitative evaluation	Target quality values have been achieved, and it has been concluded that quality is good. (Quality improvement actions have been taken where necessary.) If actual values are not within the allowable range, a validity evaluation has been conducted, and necessary quality improvement actions have been taken.
Qualitative evaluation	A quality evaluation has been conducted by analyzing the review defects, and necessary quality improvement actions have been taken. A quality evaluation has been conducted based on the quality maps for test purposes, and quality improvement actions have been taken.
Report	The final quality evaluation report has been submitted, verified by a third party, and approved by the project manager in the quality meeting.

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Variance Analysis Basics

- **Baseline Values**: Your original planned values or targets prior to launching your project (or new phase).
  Example:
  - Task X is planned to take 100 hours and be completed on June 2, 2021
  - Baseline hours: 100
  - Baseline end date: 6/2/2021
- **Variance**: is the difference between the baseline (or planned) element value and the actual element value that occurred.
  Example:
  - As Task X above, but you actually spent 150 hours, and it was finished it on June 7,2021
  - Your Effort Variance is 50 hours.
  - Your Schedule Variance is 3 days.

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Variance Analysis Basics

- **Variance Elements**:
  - Cost (Effort, Budget), Time (Schedule),
  - Mean time to repair, Average bugs per week,
  - Etc.
- **Earned Value**: A technique for objectively measuring project performance and progress, based on Baseline and Variance values.

- **Why Worry About Project Variances?**
  - Because you want the earliest possible detection of performance variances.
  - Is my project on track?
  - How much will I pay for correction actions to align the progress?

Example: Budget vs. Functionality

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Sample Project: Phase 1 - Proof of Concept		14.5%	=% Budget Used		4	=hrs Effort Variance	
		16.4%	=% Funcationally Completed		4	=hrs Schedule Variance	
WBS #	**Description**	**Estimated Hours**	**Weighted Planned Value**	**% Cmplt**	**EV Cmplt**	**Actual Hours (AC)**	**Effort Variance**
100.0	Install and configure Visual Studio, TFS and SQL Server	8	2.4%	100%	2.4%	12	4
101.0	Develop the requirements specification document	40	12.1%	75%	9.1%	36	-
102.0	Develop the business work flows and Use Cases	32	9.7%	50%	4.8%	0	-
103.0	Develop the initial prototype/mockup screens	60	18.2%	0%	0.0%	0	-
104.0	Develop the software for each prototype screen	120	36.4%	0%	0.0%	0	-
105.0	Develop test cases for each screen	10	3.0%	0%	0.0%	0	-
106.0	Test each screen	24	7.3%	0%	0.0%	0	-
107.0	Document and deliver ABC Design documents	8	2.4%	0%	0.0%	0	-
108.0	Project Management, status reports, meetings	20	6.1%	0%	0.0%	0	-
109.0	Prototype Demonstrations to Customer/HSSE	8	2.4%	0%	0.0%	0	-
	Total Baseline Estimated Hours	**330**	**100.0%**		**16.4%**	**48**	**4**

Example: EVM Chart – Effort Variance Over Time

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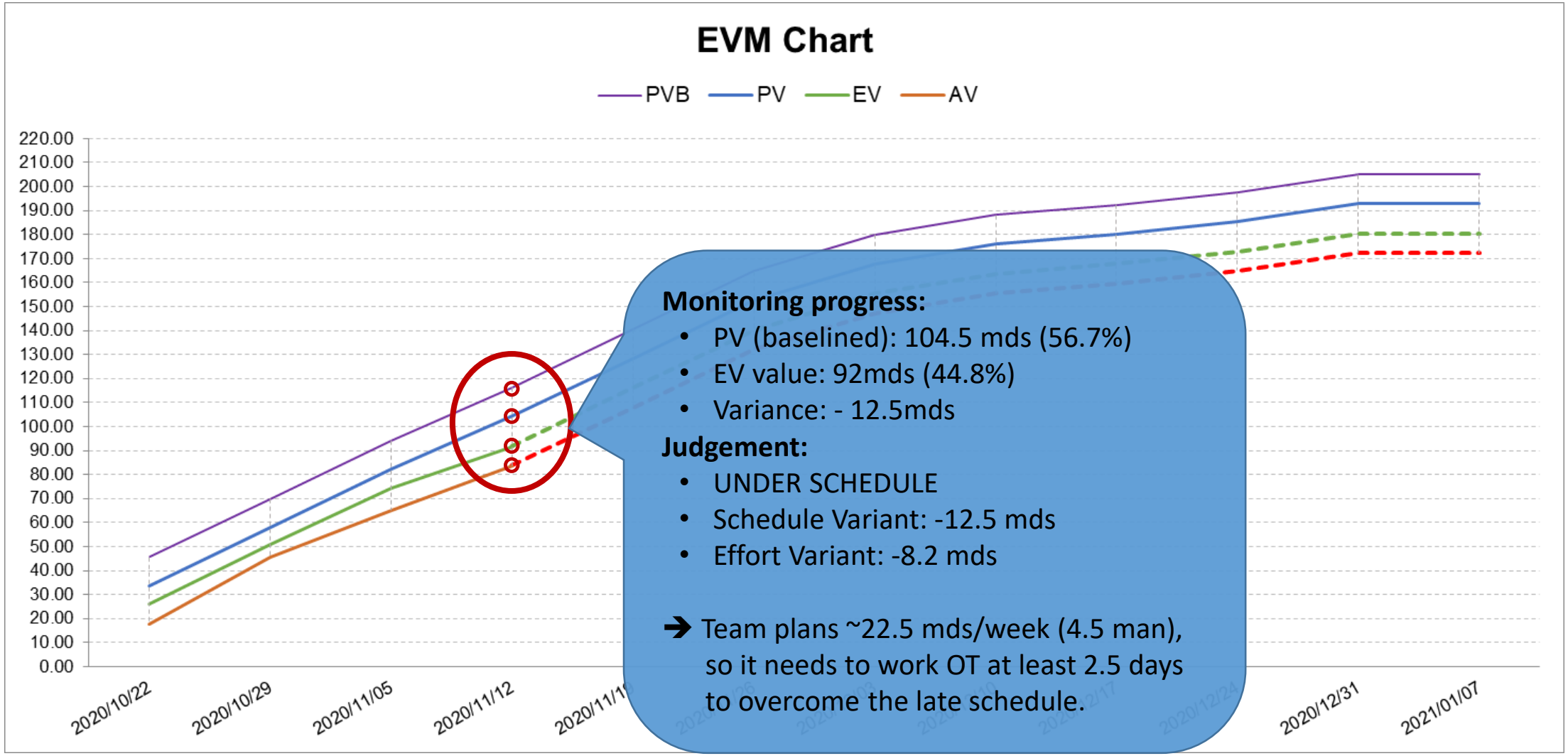

Example: Bug Density – Defect Variance Over Time

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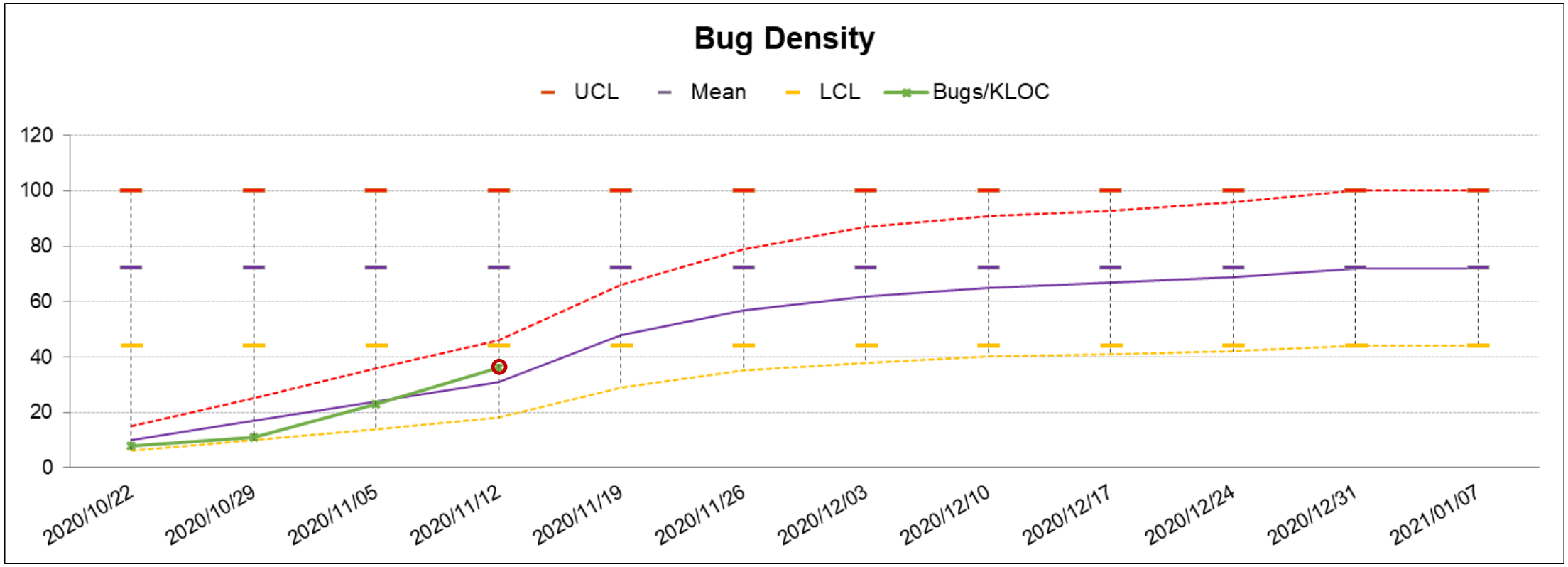

Let’s do analysis by yourself?

Tips for Effective Project Control

- Allocate enough time to perform your project control duties.
- Begin with initial baselines of schedule, scope and budget.
- Determine, measure and broadcast progress accurately and regularly.
- If you don't track your progress, you are, by definition, out of control.
- Embrace change and issues "head on" and manage them.
- If you don't know what's expected, any outcome will do.
- Avoid ALL unplanned work outside of your change control process.
- Watch out for virtual work groups.

The Right Level of Effort

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- No need for tons of project control overhead if the project is small.
- Leverage level of expertise of the people involved in the project management process.
- Consider the level of risks the company/organization can tolerate vs. the amount of project management practices applied.
- Consider Organization's ability to mitigate risks that may occur from insufficient application of project management practices.
- Consider level of trust between stakeholders and project leaders.

Early Detection = Prevention

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> *The sooner you **know** that you're behind, the more time you will have to catch up.*

Activities for Early Detection
Project control planning
Effective communication management
Project monitoring – risks, issues, variances
Be a pro-active project manager

Summary

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Project Control Basics

Reports and Communication Management

Requirement Management

Quality Management

Variance Analysis

Tips